Before the
Federal Communications Commission
Washington DC 20554

In the Matter of	)	
	)	
Service Rules for the Point-to-Point	)	
Use of the 71.0-76.0 GHz and	)	RM-10288
81.0-86.0 GHz Bands	)	

COMMENTS OF ENDWAVE CORPORATION

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Pursuant to Section 1.405(a) of the Commission's Rules, Endwave Corporation ("Endwave") hereby files these comments on the above-captioned Petition for Rulemaking of Loea Communications Corporation.[1]

Endwave strongly supports the Loea Petition.

A. Introduction

Loea requests service rules to permit prompt licensing of the 71.0-76.0 and 81.0-86.0 GHz bands for fixed point-to-point use. These frequencies are available for fixed use.[2]

Loea proposes that point-to-point licensees be required to use a minimum antenna gain of 50 dBi and typical beamwidth of less than 0.5 degrees, providing narrow "pencil beam" transmission. Loea notes that this requirement would eliminate any realistic probability of

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[1] Loea Communications Corporation, *Service Rules for the Point-to-Point Use of the 71.0-76.0 GHz and 81.0-86.0 GHz Bands*, RM-10288 (filed Sept. 10, 2001). Public notice appeared in Report No. 2504 (released Sept. 27, 2001).

[2] All but the 75.5-76.0 GHz segment is allocated to fixed use, among others. 47 C.F.R. Sec.2.106. Loea recites that the United States proposed the reallocation of the remaining segment at 75.5-76.0 GHz under WRC-2000, and requests that the Commission adopt the appropriate portions of WRC-2000. Loea Petition at 8-9 and nn. 19-20. Endwave supports the request.

interference among users, even when links are densely deployed. This enables a given geographic area to support a very large number of users.

The Commission should welcome Loea's Petition, which provides a detailed blueprint for practical realization of the Commission's long-standing interest in developing high millimeter wave systems.[3]

B. Prompt Service Rules Are in the Public Interest.

The 71.0-76.0 and 81.0-86.0 GHz bands can deliver high-speed data over several kilometers at relatively low cost. The technology is ideally suited to providing needed broadband capacity to diverse users, including consumers, businesses, educators, and health care providers.

Loea claims its equipment can meet the current Gigabit Ethernet standard of 1.25 Gbps full duplex, and that it is working to attain the 12.5 Gbps Gigabit Ethernet standard. Endwave agrees this level of performance should be attainable.

Loea emphasizes the value of high millimeter wave systems in bringing fixed point-to-point broadband systems particularly to suburban and rural areas, where population densities may not support the high costs of fiber installation. Endwave agrees; but we believe Loea has underestimated the benefits of this technology for urban areas as well. Although an urban population base provides more potential customers from whom to recover the costs of installing fiber, those costs are much higher, due to the expenses of trenching. Today fiber installation in urban areas typically runs about $250,000 - $1 million *per mile*, and imposes additional, hard-to-quantify costs in traffic disruption and public inconvenience. Some jurisdictions, including

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[3] *See FCC'S Office of Engineering and Technology to Host Forum on 90 GHz Technologies*, 15 FCC Rcd 23244 (released July 6, 2000). Endwave hopes the Commission will soon bring the 92-95 GHz band to a rulemaking as well.

Washington, DC, have responded by imposing moratoria on trenching for fiber. Other localities have imposed taxes or fees on companies installing fiber, which further drives up costs to end users.

High millimeter wave systems can also provide inexpensive conduit diversity or backup systems for fiber, to ensure continuation of essential services in the event of a fiber cut. The gigabit data rates enabled by this spectrum are necessary to provide the required bandwidth for backbone SONET-like services

In short, high millimeter wave links are an effective alternative or supplement to fiber. They can deliver comparable performance at far lower cost, regardless of population density, and without impairing activity at street level.

C. Channelization, Geographic Licensing, and Auctions Are Unnecessary and Would Hinder Use of These Bands.

Loea argues correctly that channelization, geographic licensing, and auctions not only are unnecessary at these frequencies, but also would add costs and impede utilization.

At shorter wavelengths, these measures -- often used in combination -- are effective ways to allocate scarce spectrum resources among competing users. All come within the Commission's statutory mandate of preventing interference among spectrum users.[4] Channelization is intended to minimize each user's occupied bandwidth; geographic licensing encourages rapid buildout with minimum administrative overhead; and auctions put spectrum in the hands of those who can use it to best economic advantage. Each is premised on the supply of spectrum falling short of the demand.

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[4] 47 U.S.C. Sec. 303(f).

At the high millimeter wavelengths, however, the supply of spectrum is unlimited, for all practical purposes. Assuming the Commission adopts Loea's proposals as to antenna gain and beamwidth (as modified below), multiple users will be able to operate very close together in the same area, without causing interference to one another. The Section 303(f) mandate to prevent interference then does not apply. Resource-allocation measures such as channelization, geographic licensing, and auctions are not only superfluous, under these circumstances, but they add unnecessary costs and restrictions that impede efficient use.[5]

Endwave agrees with Loea that the best use of these bands will result from a minimum of regulation. The Commission should impose technical rules to ensure narrow beamwidth and to limit power, as Loea requested, and should require frequency coordination and licensing to provide users with a degree of certainty in the reliability of their communications. (We expect the coordination process will rarely turn up an interference case.) Licensing also makes it easier for the Commission to oversee compliance with the technical rules.

D. The Commission Should Offer Alternatives to the Technical Rules.

Loea has requested antenna specifications that are difficult to meet using available fabrication processes. A minor relaxation of certain parameters will bring down the antenna cost sharply, without degrading the characteristics that support the licensing approaches discussed above.

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[5] Auctions may also be unlawful. The Communications Act restricts the Commission's authority to conduct auctions to cases where "mutually exclusive applications are accepted." 47 U.S.C. Sec. 309(j)(1). Because interference is vanishingly unlikely, applications for high millimeter wavelength licenses will rarely, if ever, be mutually exclusive.

Specifically, manufacturers should have the option of reducing antenna gain, so long as they cut maximum EIRP by twice the number of dB by which they reduce antenna gain. For example, it would be permissible to reduce antenna gain by 3 dB and EIRP by 6 dB, or antenna gain by 6 dB and EIRP by 12 dB.

In addition, the proposed backlobe requirement of 60 dB is somewhat high. Endwave believes 50 dB would be adequate. Often the mounting bracket and pole will interact with sidelobes or reflections and create energy in the backlobe region in the range of 50 dB down, so a more stringent backlobe requirement would increase cost without improving performance.

CONCLUSION

The 71.0-76.0 and 81.0-86.0 GHz bands hold great promise for efficient broadband communications, at data speeds competitive with fiber, but at far lower cost. The highly directional properties at these wavelengths allow for dense, non-interfering deployment under simple and efficient licensing rules.

The Commission should expeditiously proposed rules as Loea requested, subject to the minor technical adjustments discussed above.

Respectfully submitted,

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October 29, 2001

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SERVICE LIST

I, Mitchell Lazarus, an attorney with the law firm of Fletcher, Heald & Hildreth, PLC, hereby state that a true copy of the foregoing Comments of the Fixed Wireless Communications Coalition was transmitted by email and first class mail this 29th day of October, 2001, to the following:

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